CALS TEST NETWORK

AFCTN Test Report 93-073

AFCTB-ID 93-073

Technical Publication Transfer

Using:

Northrop Corporation's Data

MIL-D-28000A (IGES)
MIL-M-28001A (SGML)
MIL-R-28002A (Raster)
MIL-D-28003 (CGM)

Quick Short Test Report

22 July 1993

19960822 161

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Electronic Systems Center

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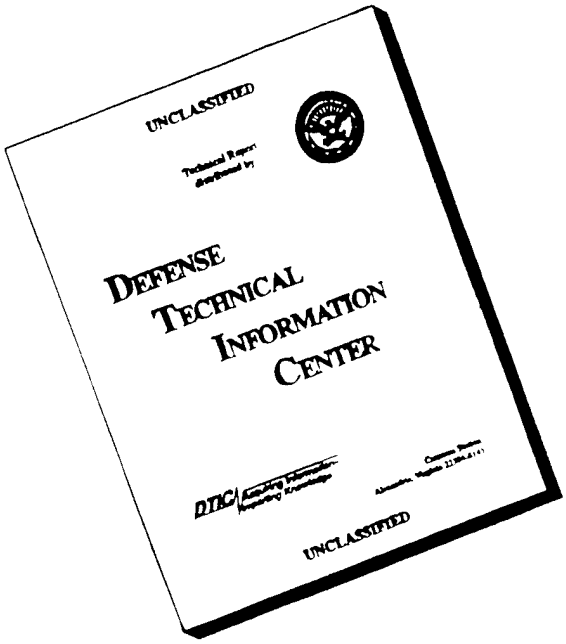

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MIL-D-28003 (CGM)

Quick Short Test Report

22 July 1993

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Contents

1. Introduction....1
1.1. Background....1
1.2. Purpose....2
2. Test Parameters....3
3. 1840A Analysis....7
3.1. External Packaging....7
3.2. Transmission Envelope....7
3.2.1. Tape Formats....7
3.2.2. Declaration and Header Fields....8
4. IGES Analysis....8
5. SGML Analysis....9
6. Raster Analysis....10
7. CGM Analysis....11
8. Conclusions and Recommendations....13
9. Appendix A - Tapetool Report Logs....14
9.1. Tape Catalog....14
9.2. Tape Evaluation Log....16
9.3. Tape File Set Validation Log....18
9.4. Other Tape Reading Logs....20
10. Appendix B - Detailed IGES Analysis....21
10.1. File D002Q006....21
10.1.1. Parser/Verifier Log....21
10.1.2. Parser Log - AutoCAD R12....28

10.1.3. Output AutoCAD R12.....36

10.1.4. Output Cadkey v5.02.....37

10.1.5. Output Cadleaf.....38

10.1.6. Output IGESView.....39

10.1.7. Output IGESWorks.....40

10.1.8. Output iges2draw/IslandDraw.....41

11. Appendix C - Detailed SGML Analysis.....42

11.1. Datalogics Parser Log.....42

11.2. Exoterica validator exl 2.0 Parser Log.....43

12. Appendix D - Detailed Raster Analysis.....46

12.1. File D003R004.....46

12.1.1. Output IGESView.....46

13. Appendix E - Detailed CGM Analysis.....47

13.1. File D001C004.....47

13.1.1. Parser Log MetaCheck.....47

13.1.2. Output Cadleaf.....49

13.1.3. Output Harvard Graphics.....50

13.1.4. Output HiJaak Pro v2.0 for Windows.....51

13.1.5. Output IslandDraw.....52

13.1.6. Output cgm2draw/IslandDraw.....53

13.1.7. Output Ventura Publisher.....54

1. Introduction

1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-Cycle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze Northrop Corporation's interpretation and use of the CALS standards in transferring technical publication data. Northrop used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff on a 9-track magnetic tape.

2. Test Parameters

Test Plan: AFCTB 93-073

Date of Evaluation: 22 July 1993

Evaluator:
George Elwood
Air Force CALS Test Bed
DET 2 HQ ESC/ENCP
4027 Colonel Glenn Hwy
Suite 300
Dayton OH 45431-1672

Data Originator:
John P. Kent
Northrop Corporation
B-2 Division
L591/UB
8900 East Washington Blvd
Pico Rivera CA 90660
310 948-0624

Data Description:
Technical Manual Test
3 Document Declaration files
3 Document Type Definitions (DTD)
4 Initial Graphics Exchange Standards (IGES) files
3 Text files
2 Raster files
5 Computer Graphics Metafile (CGM) files

Data Source System:

1840

HARDWARE

Unknown

SOFTWARE

Unknown

IGES

HARDWARE

Unknown

SOFTWARE

Unknown

Text/Standard Generalized Markup Language (SGML)

HARDWARE

Unknown

SOFTWARE

Unknown

Raster

HARDWARE

Unknown

SOFTWARE

Unknown

CGM

HARDWARE

Unknown

SOFTWARE

Unknown

Evaluation Tools Used:

MIL-STD-1840A (TAPE)

SUN 3/280

AFCTN *Tapetool v1.2.10 UNIX*
AFCTN *Tapetool v1.2.9 UNIX*
XSoft *CAPS/CALS v40.4*
Texas Instruments (TI) *Tapetool v1.0.1*

PC 486/50

AFCTN *Tapetool v1.2.10 DOS*

MIL-D-28000 (IGES)

Sun SparcStation 2

ArborText *iges2draw*
Carberry *CADLeaf Plus v3.1*
IGES Data Analysis (IDA) *Parser/Verifier v92*
IDA *IGESView v3.05*
International TechneGroup Incorporated (ITI) *IGES/Works v1.3*

PC 486/50

AUTODESK *AutoCAD 386 R12*
Cadkey *Cadkey v5.02*
IDA *IGESView Windows*

MIL-M-28001 (SGML)

SUN SparcStation 2

ArborText *ADEPT v4.2.1*

PC 486/50

Datalogics *ParserStation v3.36*
Exoterica *XGMLNormalizer v1.2e3.2*
Exoterica *Validator v2.0 EXL*
McAfee & McAdam *Sema Mark-it v2.3*
Public Domain *sgmls*

MIL-R-28002 (Raster)

SUN SparcStation 2

ArborText *g42tiff*
Carberry *CADLeaf Plus v3.1*
AFCTN *validg4*
AFCTN *calstb.475*
AFCTN *XRastb viewer*
IDA *IGESView v3.0*
Island Graphics *IslandPaint v3.0*
Rosetta Technologies *Preview v3.2*

PC 486/50

AFCTN *validg4*
IDA *IGESView Windows*
Inset Systems *HiJaak v2.1*
Inset Systems *HiJaak Window v1.0*
Corel *Ventura Publisher*

MIL-D-28003 (CGM)

SUN SparcStation 2
- ArborText *cgm2draw*
- Island Graphics *IslandDraw v3.0*
- Carberry *CADLeaf Plus v3.1*

PC 486/50
- Advance Technology Center (ATC) *MetaCheck R 2.05*
- Software Publishing Corporation (SPC) *Harvard Graphics v3.05*
- Inset Systems *HiJaak v1.0 Windows Pro*
- Micrografx *Designer v3.1*
- Corel *Ventura Publisher*

Standards Tested:

MIL-STD-1840A
MIL-D-28000A
MIL-M-28001A
MIL-R-28002A
MIL-D-28003

3. 1840A Analysis

3.1 External Packaging

The tape arrived at the Air Force CALS Test Bed (AFCTB) enclosed in a box in accordance with ASTM D 3951. The exterior of the box was marked with a magnetic tape warning label, as required by MIL-STD-1840A, para. 5.3.1.3.

The tape was enclosed in a barrier bag as required by MIL-STD-1840A, para. 5.3.1.2. Inspection of the tape reel showed the label indicating the recording density as required by MIL-STD-1840A, para. 5.3.1. Enclosed in the box was a packing list showing all files recorded on the tape.

3.2 Transmission Envelope

The 9-track tape received by the AFCTB contained MIL-STD-1840A files. The files were named per the standard conventions.

3.2.1 Tape Formats

The tape was run through the AFCTN *Tapetool v1.2.10* utility on the SUN UNIX. This software reported a system error and would not read the tape. An attempt to read the tape using AFCTN's *Tapetool v1.2.8* and *v1.2.9*, TI's *Tapetool v1.0.1*, and XSoft's *CAPS read1840A* generated the same error. A detailed analysis was conducted using various tools, and no source could be found for the errors.

The tape was then move to the MS-DOS *Tapetool v1.2.10*. No errors were encountered while evaluating the contents of the tape labels. A copy of the files was made and read without a reported error on the UNIX system.

The submitted tape could not be read on the AFCTB UNIX system but was read, with reported errors, on the MS-DOS system. The physical tape structure meets the CALS MIL-STD-1840A requirements.

3.2.2 Declaration and Header Fields

No errors were found in the Document Declaration file and data file headers. The tape headers meet the CALS MIL-STD-1840A requirements.

4. IGES Analysis

The tape contained four (4) IGES files. These files were evaluated using IDA's *parser/verifier* set for CALS Class I. No CALS errors were reported during this processes.

The AFCTB has several tools for viewing IGES files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The files were converted using ArborText's *iges2draw* utility with no reported errors. The resulting files were read into Island Graphics' *IslandDraw* and displayed. It was noted that only part of files 2Q004 and 2Q005 images displayed. An undocumented function was used in the iges2draw translator to move the files from a negative start value to a value that could be used. These modified translated files displayed and printed correctly.

The files were read using AUTODESK's *AutoCAD R12* with translator version 5.1. Many warning messages were reported during this procedure. File D002Q005 had a log file that exceeded 25K in length. No errors were noted on the displayed or hard copies.

The files were converted using Cadkey's *ig2c* utility. The resulting files were read into Cadkey's *Cadkey*, displayed and printed. File D002Q004 had some noted errors with entity 126, which caused them to overflow the defined box area. Note, Cadkey 5.02 does not support the 126 entity.

The files were read into Carberry's *CADLeaf* software without a reported error. File D002Q006 had an error displayed in the general note sample. The vertical stacked letters were displayed at a 45 degrees angle. The letters rotated to an angle of 315 instead of 180.

The files were read using IDA's *IGESView* and *IGESView for Windows*. File D002Q006 had an error in the imbedded font change block.

The files were read using ITI's *IGESWorks* without a reported error. The files were displayed.

The IGES files meet the CALS MIL-D-28000A specification.

5. SGML Analysis

The tape contained three (3) DTD and three (3) Text files.

The AFCTB has several parsers available for evaluating submitted DTD and Text files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. These products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings unless specified in the report. Changes to DTD or Text files required by each system are not documented in the report.

The Text and DTD files from the tape were evaluated using Datalogics' *ParseStation*. No errors were reported.

The Text and DTD files from this document were evaluated using the Exoterica *Validator exl* parser. No errors were reported.

The Text and DTD files from this document were tested using the Exoterica *XGMLNormalizer* parser with no reported errors.

The Text and DTD files from the tape were evaluated using McAfee & McAdam's *Sema Mark-it* parser with no reported errors.

The Text and DTD files from the tape were evaluated using the Public Domain *sgmls* parser with no reported errors.

Because the included Text files were small and only pointed to the graphics files, no attempt was made to publish the documents.

The SGML files on the tape meet the CALS MIL-M-28001A specification.

6. Raster Analysis

The tape contained two (2) Raster files. All files were evaluated using the AFCTN *validg4* utility. This program reported that file D003R004 meets the CALS MIL-R-28002A specifications. File D003R005 is a type II Raster file and the AFCTB has no capability to display this file type.

The file was read into the AFCTN *calstb.475* viewing utility, with no reported problems. The AFCTN *XRastb* was also used to import and display the file.

The AFCTB has several tools for viewing Raster files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The file 3R004 was converted using ArborText's *g42tiff* utility without a reported error. The resulting file was read into Island Graphics' *IslandPaint* and displayed.

The Raster file 3R004 was read into Carberry's *CADLeaf* software without a reported error. The image was displayed.

The file 3R004 was read into IDA's *IGESView* and *IGESView for Windows* without a reported error.

The file 3R004 was read into Inset Systems' *HiJaak for Windows* without a reported error.

The Raster file 3R004 was converted using Rosetta Technologies' *Prepare* without a reported error. The resulting file was read into *Preview* and displayed.

The D003R004 Raster file meets the CALS MIL-R-28002A specification.

7. CGM Analysis

The tape contained four (4) CGM files. The files were evaluated using ATC's *MetaCheck* with CALS options. This utility reported that all files meet the CALS MIL-D-28003 specification.

The AFCTB has several tools for viewing CGM files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor and indication of CALS capability. All operations were performed using the default settings.

The CGM files were converted using ArborText's *cgm2draw* utility without a reported error. The resulting files were read into Island Graphics' *IslandDraw*, displayed and printed. File 1C004 had noted text overflows in the restricted text block, and a random line was noted in block 8. File 1C005 had noted text overflows in the restricted text block and most text identifiers. The remaining files appeared to be correct.

The files were read into Carberry's *CADLeaf* software, displayed and printed. File 1C004 had three noted text overflows. File 1C005 had several noted text overflows. No errors were noted in the entities. The remainder of the files appeared to be correct.

The files were read into Inset Systems' *HiJaak Pro V2.0 for Windows*. File D001C004 imported without a reported error, however, text overflow was noted, and the line test showed all solid lines instead of the dashed lines.

The files were imported directly into Island Graphics' *IslandDraw* without a reported error. File 1C004 displayed an error in the appended text with the letters spread around the image. File 1C005 displayed most of the entities and text in the lower left corner of the image. The remainder of the images appeared to be correct.

The files were imported into the Micrografx *Designer*. File 1C004 had a displayed error message. The remaining files reported no messages and displayed nothing.

According to Michael Harrison of Micrografx, "Micrografx is aware of the problems associated with reading these files and is working on a solution to be implemented in a future release of our products."

The files were imported into SPC's *Harvard Graphics 3.05* with reported errors. All files reported line style errors, non-CGM entities encountered, and entities not translated. None of the images were usable.

The files were imported into Corel's *Ventura Publisher*. File 1C005 would not import, yet no error was reported. File 1C008 was reported as a bad file. Text errors were noted in the restricted text block and appended text block. The entities in the polygon set and cell array did not display. Files 1C006 and 1C007 were not usable when displayed. File 1C006 cause the software to halt and return to the MSDOS prompt.

The CGM files were reported as meeting the CALS MIL-D-28003 specification.

8. Conclusions and Recommendations

The tape had no reported errors in the structure and CALS headers. There was a problem reading the tape on the UNIX system in the test bed. Analysis of the tape uncovered no errors.

The IGES files meet the CALS MIL-D-28000A specification.

The SGML files meet the CALS MIL-M-28001A specification.

The tape contained both a type I and type II Raster files. The type I file meets the CALS MIL-R-28002A specification. The AFCTB currently has no means to evaluate type II Raster files.

The CGM files were reported as meeting the CALS MIL-D-28003 specification. The software tools available in the AFCTB had different levels in successfully translating the files.

The tape meets the CALS MIL-STD-1840A requirements.

9. Appendix A - Tapetool Report Logs

9.1 Tape Catalog

```
Air Force CALS Test Network Catalog Evaluation - Version 1.2; Release 10 (C)

  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information
    ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
                        for Information Interchange
    ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Wed Jul 21 16:06:15 1993
MIL-STD-1840A File Catalog
File Set Directory: /cals/u1210/Set003

                                                                    Page:
                                                                    1

                                                Record
                                                Format/    Block
                                                Selected/
File Name                File Type              Length  Length/Total
Extracted
-----------------------------------------------------------------------------
---
D001                     Document Declaration   D/00260 02048/000001
Extracted
D002                     Document Declaration   D/00260 02048/000001
Extracted
D003                     Document Declaration   D/00260 02048/000001
Extracted
D001C004                 CGM                    F/00080 00800/000004
Extracted
                  <<<<< PART OF LOG FILE REMOVED HERE >>>>>
D001C009                 CGM                    F/00080 00800/000002
Extracted
D001G002                 DTD                    D/00260 02048/000034
Extracted
D001H003                 Output Specification   D/00260 02048/000001
Extracted
D001T001                 Text                   D/00260 02048/000001
Extracted
```

```
D002G002                DTD                     D/00260 02048/000034
Extracted
D002H003                Output Specification    D/00260 02048/000001
Extracted
D002Q004                IGES                    F/00080 02000/000016
Extracted
                  <<<<< PART OF LOG FILE REMOVED HERE >>>>>
D002Q007                IGES                    F/00080 02000/000047
Extracted
D002T001                Text                    D/00260 02048/000001
Extracted
D003G002                DTD                     D/00260 02048/000034
Extracted
D003H003                Output Specification    D/00260 02048/000001
Extracted
D003R004                Raster                  F/00128 02048/000016
Extracted
D003R005                Raster                  F/00128 02048/000008
Extracted
D003T001                Text                    D/00260 02048/000001
Extracted

Catalog Process terminated normally.
```

9.2 Tape Evaluation Log

```
Air Force CALS Test Network Tape Evaluation - Version 1.2; Release 10 (C)
  Standards referenced:
    ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
                        for Information Interchange
    ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Wed Jul 21 16:05:33 1993

ANSI Tape Import Log

Allocating tape drive /dev/rmt0...

/dev/rmt0 allocated.

VOL1CALS01
4

  Label Identifier: VOL1
  Volume Identifier: CALS01
  Volume Accessibility:
  Owner Identifier:
  Label Standard Version: 4

HDR1D001             CALS0100010001000000 93202 00000 000000

  Label Identifier: HDR1
  File Identifier: D001
  File Set Identifier: CALS01
  File Section Number: 0001
  File Sequence Number: 0001
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  93202
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000000
  Implementation Identifier:

HDR2D0204800260                                    00

  Label Identifier: HDR2
  Recording Format: D
  Block Length: 02048
```

```
  Record Length: 00260
  Offset Length: 00

************ Tape Mark ***************

  Actual Block Size Found = 2048 Bytes.

  Number of data blocks read = 1.

************ Tape Mark ***************

EOF1D001             CALS0100010001000000 93202 00000 000001

  Label Identifier: EOF1
  File Identifier: D001
  File Set Identifier: CALS01
  File Section Number: 0001
  File Sequence Number: 0001
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  93202
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000001
  Implementation Identifier:

EOF2D0204800260                                    00

  Label Identifier: EOF2
  Recording Format: D
  Block Length: 02048
  Record Length: 00260
  Offset Length: 00

************ Tape Mark ***************

                    <<<<< PART OF LOG FILE REMOVED HERE >>>>>

************ Tape Mark ***************

############ End of Volume CALS01 ###############
############ End Of Tape File Set ###############

Deallocating /dev/rmt0...
Tape Import Process terminated normally.
```

9.3 Tape File Set Validation Log

```
Air Force CALS Test Network File Set Evaluation - Version 1.2; Release 10 (C)

  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information

Wed Jul 21 16:06:15 1993

MIL-STD-1840A File Set Evaluation Log

File Set: Set003

Found file: D001
Extracting Document Declaration Header Records...
Evaluating Document Declaration Header Records...

srcsys: CALS TEST BED
srcdocid: CALS_CGM_TEST1
srcrelid: NONE
chglvl: ORIGINAL
dteisu: 19930126
dstsys: CALS TEST BED
dstdocid: STPRO25.6
dstrelid: NONE
dtetrn: 19930721
dlvacc: NONE
filcnt: C6,G1,H1,T1
ttlcls: UNCLASSIFIED
doccls: UNCLASSIFIED
doctyp: JOB GUIDE
docttl: graphics test

                    <<<<< PART OF LOG FILE REMOVED HERE >>>>>

Evaluating numbering scheme...
No errors were encountered during numbering scheme evaluation.
Numbering scheme evaluation complete.

Checking file count...
No errors were encountered during file count verification.
File Count verification complete.

No errors were encountered in Document D001.
```

```
Found file: D002
Extracting Document Declaration Header Records...
Evaluating Document Declaration Header Records...

srcsys: CALS TEST BED
srcdocid: CALS_IGES_TEST1
srcrelid: NONE
chglvl: ORIGINAL
dteisu: 19930126
dstsys: CALS TEST BED
dstdocid: STPRO25.8
dstrelid: NONE
dtetrn: 19930721
dlvacc: NONE
filcnt: G1,H1,Q4,T1
ttlcls: UNCLASSIFIED
doccls: UNCLASSIFIED
doctyp: JOB GUIDE
docttl: graphics test
```

<<<<< PART OF LOG FILE REMOVED HERE >>>>>

```
Evaluating numbering scheme...
No errors were encountered during numbering scheme evaluation.
Numbering scheme evaluation complete.

Checking file count...
No errors were encountered during file count verification.
File Count verification complete.

No errors were encountered in Document D002.

Found file: D003
Extracting Document Declaration Header Records...
Evaluating Document Declaration Header Records...

srcsys: CALS TEST BED
srcdocid: CALS_RAS_TEST1
srcrelid: NONE
chglvl: ORIGINAL
dteisu: 19930126
dstsys: CALS TEST BED
dstdocid: STPRO25.10
dstrelid: NONE
dtetrn: 19930721
dlvacc: NONE
```

```
filcnt: G1,H1,R2,T1
ttlcls: UNCLASSIFIED
doccls: UNCLASSIFIED
doctyp: JOB GUIDE
docttl: graphics test

                    <<<<< PART OF LOG FILE REMOVED HERE >>>>>

Evaluating numbering scheme...
No errors were encountered during numbering scheme evaluation.
Numbering scheme evaluation complete.

Checking file count...
No errors were encountered during file count verification.
File Count verification complete.

No errors were encountered in Document D003.

No errors were encountered in this File Set.

MIL-STD-1840A File Set Evaluation Complete.
```

9.4 Other Tape Reading Logs

Include other log here if errors were reported.

10. Appendix B - Detailed IGES Analysis

10.1 File D002Q006

10.1.1 Parser/Verifier Log

```
 ************************************
 *****  IGES PARSER/VERIFIER   *****
 *****       MARCH 1993        *****
 *****   IGES Data Analysis    *****
 *****     (708) 344-1815      *****
 ************************************

 Input file is /novell/9373/q206.igs

 Checking conformance to CALS Class I (MIL-D-28000A 2/10/92)

 Today is July 22, 1993  8:18 AM

 ************************************
 *****    CHECK FILE SYNTAX    *****
 ************************************

    Section        Records

    Start             16
    Global             3
    Directory        296  (    148 Entities)
    Parameter        301
    Terminate          1

WARNING 2487: Status fields not one number at D      1.
WARNING 2487: Messages regarding status fields suppressed.
NITPICK 2489: Excess precision in real constant (-0.216506) for P1.Y of D
              63.
NITPICK 2489: Messages regarding excess precision suppressed.

 ************************************
 *****  SUMMARY AND STATISTICS  ****
 ************************************

 *** File and Product Name Information ***
```

```
   File name from sender     = 'IENTITY'
   File creation Date.Time   = '891031.080000'
   Model change Date.Time    = ''
   Author                    = 'KASSEL'
   Department                = 'Air Force CALS Test Network'
   Product name from sender  = 'IENTITY'
   Destination product name  = 'IENTITY'

*** Parameter Delimiters ***

   Delimiter  = ','
   Terminator = ';'

*** Originating System Data ***

   System ID              = 'NONE'
   Preprocessor version   = 'TEST'
   Specification version  = 6 (IGES 4.0)

*** Precision levels ***
   Integer bits =    32
   Floating point  -  Exponent =    38  Mantissa =     6
   Double precision - Exponent =   308  Mantissa =    15

*** Global Model Data ***

   Model scale             =  1.0000E+00
   Unit flag               =  1
   Units                   =  'INCH'
   Line weights            =  8
   Maximum line thickness  =  1.600000E-02
   Minimum line thickness  =  2.000000E-03
   Granularity             =  1.000000E-02
   Maximum coordinate      =  2.200000E+01

   Drafting standard applicable to original data is not specified.

*** Status Flag Summary ***

 Blank status:  Visible                    148
                Blanked                     0

 Independence:  Independent                126
                Physically Subordinate      19
                Logically Subordinate        3
                Totally Subordinate          0
```

Entity use:	Geometry	87
	Annotation	55
	Definition	6
	Other	0
	Logical/Positional	0
	2D parametric	0
	Construction geometry	0
	Not Specified	0
Hierarchy:	Structure DE applies	31
	Subordinate DE applies	117
	Hierarchy property applies	0
	Not Specified	0

*** Entity Occurrence Counts ***

Entity	Form	Level	Count	Type
0	0	0	37	Null entity
100	0	0	3	Circular arc
102	0	0	2	Composite curve
104	0	0	1	Conic arc - general form
104	1	0	1	Conic arc - ellipse
104	2	0	1	Conic arc - hyperbola
104	3	0	1	Conic arc - parabola
106	11	0	1	Copious data - Piecewise planar, linear string(2D
106	63	0	1	Simple closed planar curve
110	0	0	27	Line
112	0	0	2	Parametric spline curve
124	0	0	5	Transformation matrix
126	0	0	1	Rational B-spline curve
126	1	0	1	Rational B-spline curve - Line
126	2	0	1	Rational B-spline curve - Circular arc
126	3	0	1	Rational B-spline curve - Elliptical arc
126	4	0	1	Rational B-spline curve - Parabolic arc
126	5	0	1	Rational B-spline curve - Hyperbolic arc
212	0	0	38	General note
212	1	0	1	General note - dual stack dimension
212	2	0	2	General note - imbedded font change dimension
212	3	0	1	General note - superscripted dimension
212	4	0	1	General note - subscripted dimension
212	5	0	1	General note - super-/sub-scripted dimension
212	6	0	1	General note - multiple stack/left justified
212	7	0	1	General note - multiple stack/center justified

212	8	0	1	General note - multiple stack/right justified
212	100	0	1	General note - simple fractional dimension
212	101	0	1	General note - dual stack fractional dimension
212	102	0	1	General note - imbedded font change/double fractio
212	105	0	1	General note - super-/sub-scripted fractional dime
230	0	0	1	Sectioned area (Standard Crosshatching)
308	0	0	1	Subfigure definition
404	0	0	1	Drawing
406	16	0	1	Property - Drawing size
406	18	0	1	Property - Intercharacter spacing
408	0	0	1	Single subfigure instance
410	0	0	1	View - Orthographic parallel
412	0	0	1	Rectangular subfigure instance
414	0	0	1	Circular subfigure instance

*** Entity Count by Level ***

Level	Count
0	148

*** Labeling Information ***

25% of the entities are labeled.

Unlabeled	111

*** Line Fonts Used in Data ***

100	102	104	106	108	110	112	114	
-	-	-	-	-	-	-	-	Undefined
3	2	4	2	-	27	2	-	Solid
-	-	-	-	-	-	-	-	Dashed
-	-	-	-	-	-	-	-	Phantom
-	-	-	-	-	-	-	-	Center-line
-	-	-	-	-	-	-	-	Dotted
-	-	-	-	-	-	-	-	User defined

116	118	120	122	124	125	126	128	
-	-	-	-	5	-	-	-	Undefined
-	-	-	-	-	-	6	-	Solid

<<<<< *PART OF LOG FILE REMOVED HERE* >>>>>

*** Line Widths Used in Data ***

```
     Weight       Count      Width

  Defaulted       111       (0.0020)

 *** Colors Used in Data ***

  Defaulted        15
        Red        96

 ************************************
 *****      ENTITY ANALYSIS      *****
 ************************************

 *** Entity type: 0

NOTE    2307: Entity type not checked.

 *** Entity type: 100

 *** Entity type: 102

 *** Entity type: 104

 *** Entity type: 106

 *** Entity type: 110

  --    27 lines averaging 7.156251E+00 units --

 *** Entity type: 112

 *** Entity type: 124

WARNING 2492: Undefined line font value (0) specified for D     37.
WARNING 2492: Undefined line font value (0) specified for D     61.
WARNING 2492: Undefined line font value (0) specified for D     65.
WARNING 2492: Undefined line font value (0) specified for D     69.
WARNING 2492: Undefined line font value (0) specified for D     75.
5 transformation matrices, 5 non-zero translations.
NOTE    2341: 5 matrices contain translation information.

 *** Entity type: 126

 *** Entity type: 212
```

```
WARNING 2492: Undefined line font value (0) specified for D     161.
WARNING 2492: Undefined line font value (0) specified for D     163.
WARNING 2492: Undefined line font value (0) specified for D     165.
WARNING 2492: Undefined line font value (0) specified for D     167.
WARNING 2492: Undefined line font value (0) specified for D     169.
WARNING 2492: Messages regarding undefined line font suppressed.
       129 text strings in data file.
       Average text aspect ratio in file is 0.9982875.
       Minimum text aspect ratio in file is 0.7978667.
       Maximum text aspect ratio in file is 1.4857143.

       FONTS USED IN FILE

       FONT    COUNT    NAME

          1      127    Default ASCII Style
       1002        2    Symbol Font 2

 *** Entity type: 230

 *** Entity type: 308

  Subfigure name at D      25: 'PERSON'.
    Number of included entities = 6.

 *** Entity type: 404

Drawing at D     287 contains 1 views.
Drawing at D     287 contains 0 annotation entities.

 *** Entity type: 406

 *** Entity type: 408

  Subfigure instance at D     263 references subfigure at D      25.

 *** Entity type: 410

  Scale of view at D      55 is 1.000000E+00.
Orthographic View entity at D      55 has  0 clipping planes specified.
   XMIN = Not Set        XMAX = Not Set
   YMIN = Not Set        YMAX = Not Set
   ZMIN = Not Set        ZMAX = Not Set

 *** Entity type: 412
```

```
 Rectangular subfigure instance at D    291 references entity at D     25.

*** Entity type: 414

 Circular subfigure instance at D    293 references entity at D     25.

*** Message Summary ***

2038: 60 Invalid Line font values.
2050: 31 Status fields not one number.

*** Error Summary ***

     0 fatal errors
     0 severe errors
     0 errors
    91 warnings
     0 cautions
    49 nitpicks
     2 notes

*** End of Analysis of /novell/9373/q206.igs ***
```

10.1.2 Parser Log - AutoCAD R12

```
Title: IGESIN Journal (v5.1 Nov 05 1992)
================================================================================
=
File: C:/9373/Q206.xli
Date: Thu, Jul 22, 1993
Time: 10:17:34
================================================================================
=

EVALUATION VERSION -- NOT FOR RESALE

Translator S/N:   117-10075750
Translating from IGES file:        C:/9373/Q206.IGS
            to AutoCAD Drawing:    C:\9373\Q206.dwg

================================================================================
=

Options obtained from:  default settings
Curves Approximated to Tolerance of          0.01
Surfaces Approximated to Tolerance of        0.01

Text Font/Style mapping:
IGES Text font      Style Name       ACAD Font
         0                SYMBOL0        iges0
         1               STANDARD          txt
         2                  LEROY          txt
         3                 FUTURA          txt
         6                 COMP80          txt
        12                GOTHICE       gothice
        13                GOTHICI       gothici
        14                 ROMANS        romans
        17                 ROMANT        romant
        18                 ROMAND        romand
        19                    OCR           txt
      1001                SYMBOL1      iges1001
      1002                SYMBOL2      iges1002
      1003                SYMBOL3      iges1003
      2001                  KANJI       bigfont

IGES Linefont/AutoCAD Linetype mapping
IGES Line Font      AutoCAD linetype        Shape file
         0                   BYLAYER
```

```
         1                CONTINUOUS
         2                    DASHED              acad.lin
         3                   PHANTOM              acad.lin
         4                    CENTER              acad.lin
         5                       DOT              acad.lin

================================================================================
=

Parse phase

*** Warning (IEVM_FORM_ZERO_CONIC_104) ***
(DE 71, TF 104:0) Form 0 conic found, entity's form number should be 1.

Action taken: Form number changed to 1.

*** Warning (IEVM_BAD_CONTINUITY_112) ***
(DE 141, TF 112:0) Entity's Degree of Continuity, 1, is incorrectly
specified.
Degree of Continuity calculated to be 2.

Action taken: Degree of Continuity set to 2.

*** Warning (IEVM_BAD_JUSTIFICATION_212) ***
(DE 171, TF 212:8) Entity's substrings are not correctly justified.

*** Warning (IEVM_BAD_JUSTIFICATION_212) ***
(DE 173, TF 212:7) Entity's substrings are not correctly justified.

================================================================================
=
Start Section:

CONFORMANCE:  This IGES file comforms to the MIL-D-28000 Amendment 1
              Class I subset Technical Illustrations dated
              20 December 1988.

ILLUSTRATION
       NAME:  IENTITY, Revision A

DESCRIPTION:  Reference drawing named I-entity which is
              comprised of all the IGES entities specified
              in MIL-D-28000 Class I.  Contact the CALS
              Test Network to obtain procedures for conducting
              the test and evaluating the results.
```

Global Section:

Parameter Delimiter:	,
Record Delimiter:	;
Sending Product ID:	IENTITY
File Name:	IENTITY
System ID:	NONE
Preprocessor Version:	TEST
Size of Integer:	32
Sgl. Precision Mag:	38
Sgl. Precision Sig:	6
Dbl. Precision Mag:	308
Dbl. Precision Sig:	15
Receiving Product ID:	IENTITY
Model Space Scale:	1.000000
Unit Flag:	1
Unit String:	INCH
# of Line Weights:	8
Maximum Line Width:	0.016000
Creation Date:	10/31/89 08:00:00
Minimum Resolution:	0.010000
Maximum Coordinate:	22.000000
Author:	KASSEL
Organization:	Air Force CALS Test Network
IGES Version Number:	6
Drafting Standard:	0

Entity Summary:

Type	Form	Description	Count
0	0	Null Entity	37
100	0	Circular Arc	3
102	0	Composite Curve	2
104	1	Ellipse	2
104	2	Hyperbola	1
104	3	Parabola	1

```
106        11    Planar Piecewise Linear Curve
1
106        63    Simple Closed Planar Curve
1
110         0    Line
27
112         0    Parametric Spline Curve
2
124         0    Transformation Matrix
5
126         0    Rational B-Spline Curve (General)
1
126         1    Rational B-Spline Curve (Line)
1
126         2    Rational B-Spline Curve (Circle)
1
126         3    Rational B-Spline Curve (Ellipse)
1
126         4    Rational B-Spline Curve (Parabola)
1
126         5    Rational B-Spline Curve (Hyperbola)
1
212         0    General Note (Simple)
38
212         1    General Note (Dual stack)
1
212         2    General Note (Font change)
2
212         3    General Note (Superscript)
1
212         4    General Note (Subscript)
1
212         5    General Note (Super/subscript)
1
212         6    General Note (Left justified)
1
212         7    General Note (Center justified)
1
212         8    General Note (Right justified)
1
212       100    General Note (Simple fraction)
1
212       101    General Note (Dual stack fract.)
1
212       102    General Note (Fnt chg/dbl fract.)
1
```

```
  212       105    General Note (Sup/sub fraction)
  1
  230         0    Section Area (Standard Fill)
  1
  308         0    Subfigure Definition
  1
  404         0    Drawing (form 0)
  1
  406        16    Property (Drawing Size)
  1
  406        18    Property (Int-character Spacing)
  1
  408         0    Subfigure Instance
  1
  410         0    View
  1
  412         0    Rectangular Array Subfigure Instance
  1
  414         0    Circular Array Subfigure Instance
  1
-------------------------------------------------------------------------------
-
                                                                      Total
                                                                      148
===============================================================================
=

Translation phase

*** Warning (ACAD_I2AMAKESTYLEERROR) ***
Error creating text style.  Most likely could not open the
shape file for a font.  Text will be forced to STANDARD.
The style attempted was named: SYMBOL2

Drawing Entity (404 Form 0) at DE 287, with
   name = ,
   size = 17.000000, 11.000000,
   units = IN,
was processed in the AutoCAD drawing file:  C:\9373\Q206.dwg

*** Warning (ACAD_NEW_VIEW_VOLUME_GENERATED) ***
( DE: 55 TF: 410:0 )
A new view volume has been generated for the view with:
 XMIN (-1.387879), XMAX (18.386881),
 YMIN (-1.386881), YMAX (12.386881),
 ZMIN (-1.886881), ZMAX (1.886881).
```

IGES Entity Summary

Type	Form	Description	Count	Processed	Errors
0	0	Null Entity	33	33	0
100	0	Circular Arc	3	3	0
102	0	Composite Curve	2	2	0
104	1	Ellipse	2	2	0
104	2	Hyperbola	1	1	0
104	3	Parabola	1	1	0
106	11	Planar Piecewise Linear Curve	1	1	0
106	63	Simple Closed Planar Curve	1	1	0
110	0	Line	23	23	0
112	0	Parametric Spline Curve	2	2	0
126	0	Rational B-Spline Curve (General)	1	1	0
126	1	Rational B-Spline Curve (Line)	1	1	0
126	2	Rational B-Spline Curve (Circle)	1	1	0
126	3	Rational B-Spline Curve (Ellipse)	1	1	0
126	4	Rational B-Spline Curve (Parabola)	1	1	0
126	5	Rational B-Spline Curve (Hyperbola)	1	1	0
212	0	General Note (Simple)	38	38	0
212	1	General Note (Dual stack)	1	1	0
212	2	General Note (Font change)	2	2	0
212	3	General Note (Superscript)	1	1	0
212	4	General Note (Subscript)	1	1	0
212	5	General Note (Super/subscript)	1	1	0
212	6	General Note (Left justified)	1	1	0
212	7	General Note (Center justified)	1	1	0
212	8	General Note (Right justified)	1	1	0
212	100	General Note (Simple fraction)	1	1	0
212	101	General Note (Dual stack fract.)	1	1	0
212	102	General Note (Fnt chg/dbl fract.)	1	1	0
212	105	General Note (Sup/sub fraction)	1	1	0
230	0	Section Area (Standard Fill)	1	1	0
308	0	Subfigure Definition	1	1	0
404	0	Drawing (form 0)	1	1	0
406	16	Property (Drawing Size)	1	1	0
408	0	Subfigure Instance	1	1	0
410	0	View	1	1	0
412	0	Rectangular Array Subfigure Instance	1	1	0
414	0	Circular Array Subfigure Instance	1	1	0
Totals			134	134	0

Unsupported IGES Entity Summary

Type	Form	Description	Count
406	18	Property (Int-character Spacing)	1
Total			1

AutoCAD Entity Summary

Entity	Created	Errors
LINE	31	0
CIRCLE	1	0
TEXT	134	0
ARC	2	0
INSERT	57	0
POLYLINE	14	0
BLOCK	50	0
Totals	289	0

Error Summary:

The following message was issued 1 time(s)
Form 0 conic found, entity's form number should be %d.

The following message was issued 1 time(s)
Entity's Degree of Continuity, %d, is incorrectly specified. Degree of Continuity calculated to be %d.

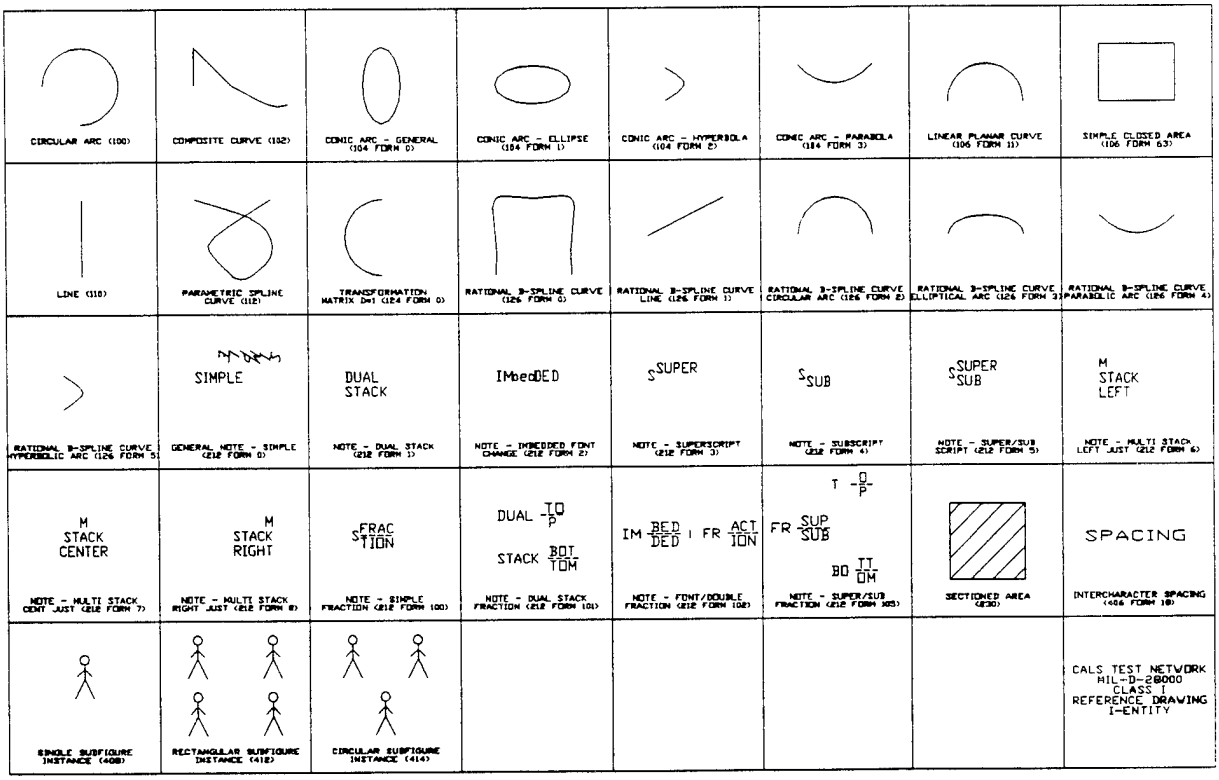
The following message was issued 2 time(s)
Entity's substrings are not correctly justified.

The following message was issued 1 time(s)
A new view volume has been generated for the view with:
XMIN (%lf), XMAX (%lf),
YMIN (%lf), YMAX (%lf),
ZMIN (%lf), ZMAX (%lf).

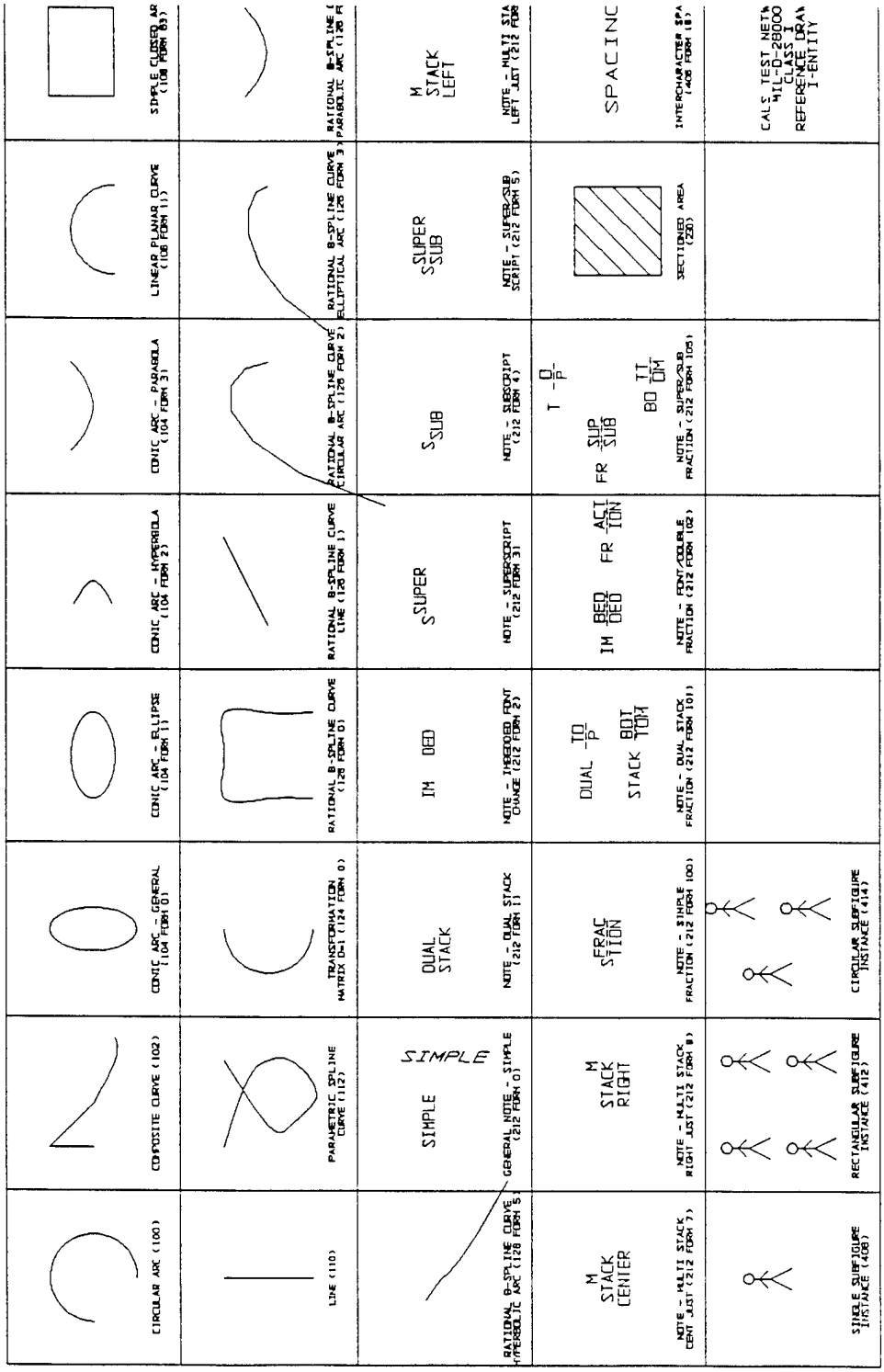
The following message was issued 2 time(s)
Error creating text style. Most likely could not open the shape file for a font. Text will be forced to STANDARD.
The style attempted was named: %s

```
Status:  0
Warning: 7
Error:   0
Fatal:   0

Elapsed Time:

Processor: 00:00:26
Clock:     00:00:26
```

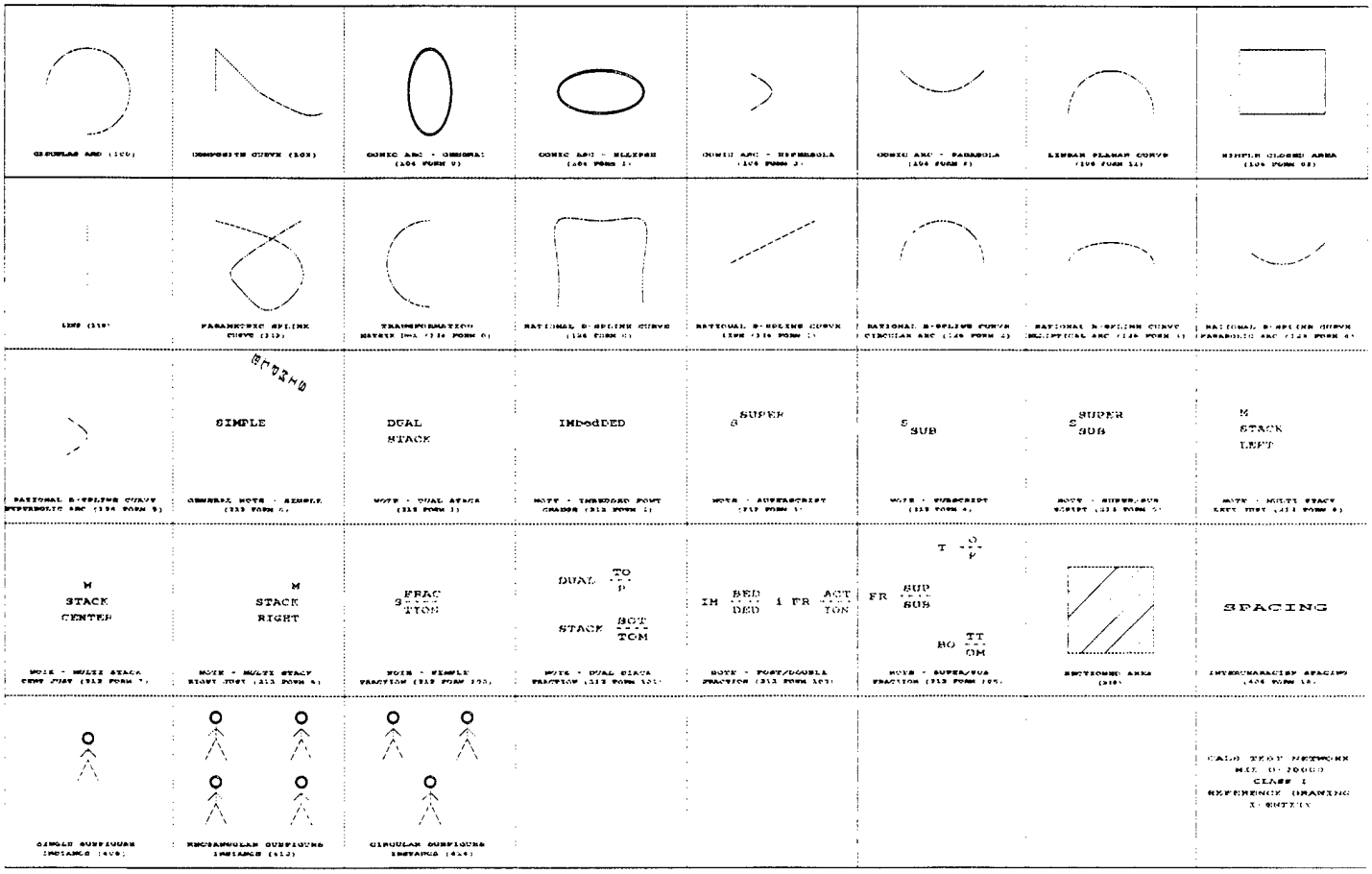
10.1.3 Output AutoCAD R12



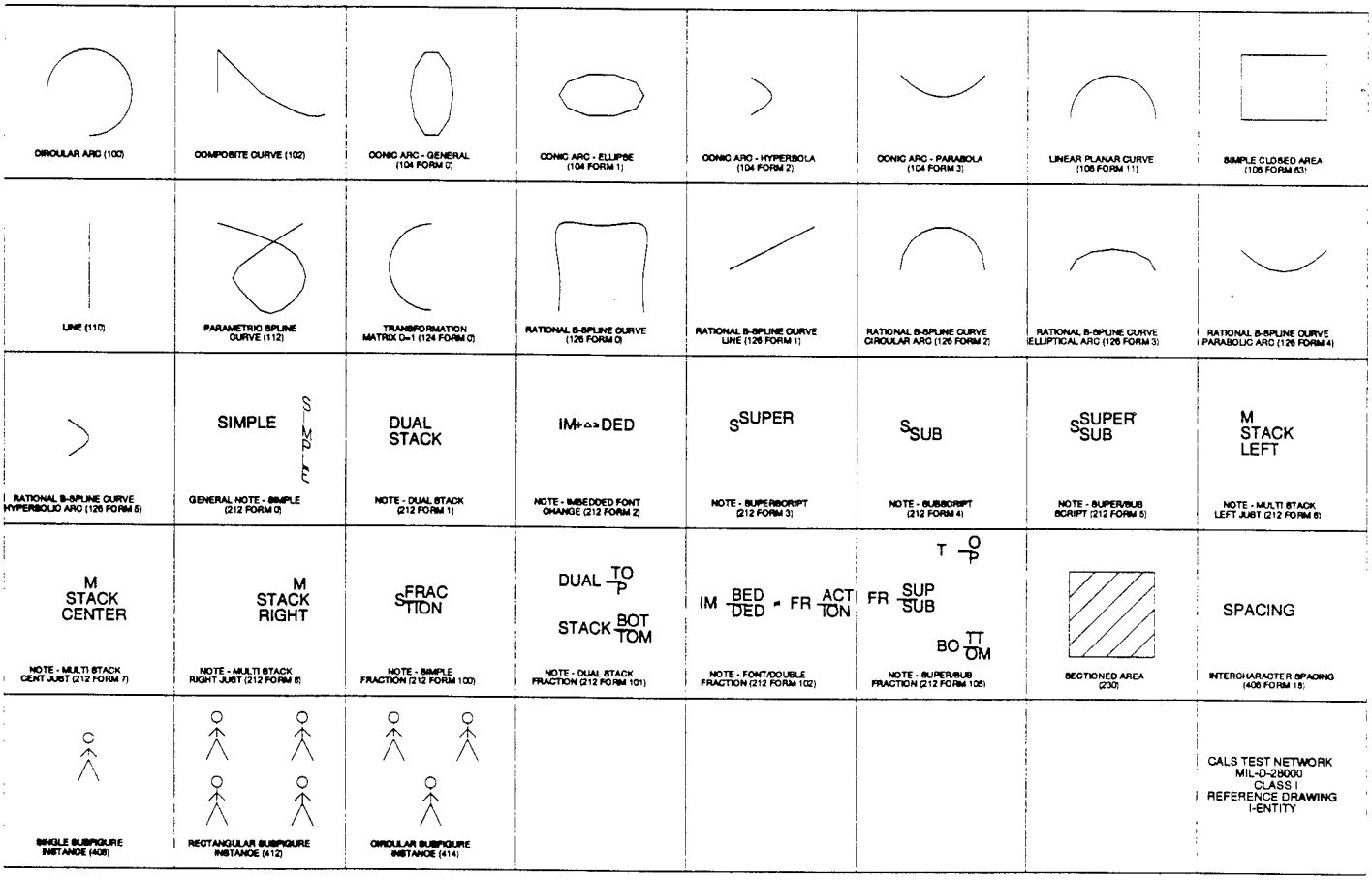
10.1.4 Output Cadkey v5.02



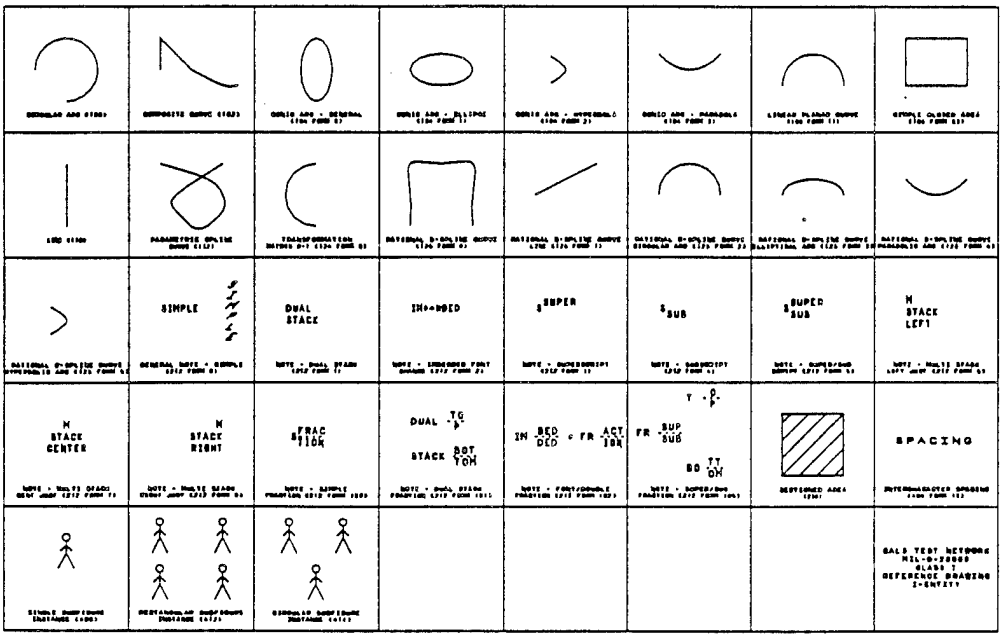
10.1.5 Output Cadleaf



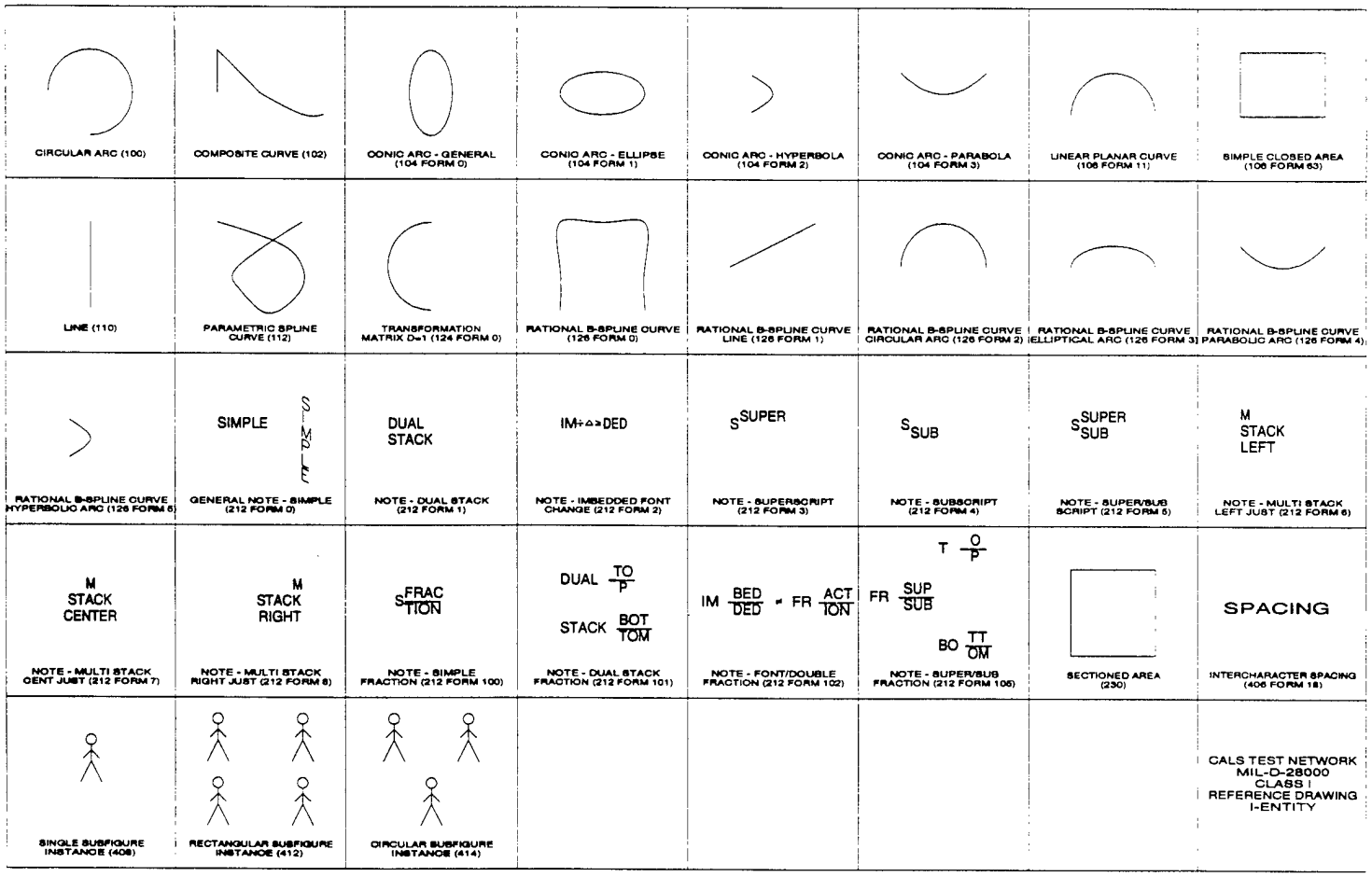
10.1.6 Output IGESView



10.1.7 Output IGESWorks



10.1.8 Output iges2draw/IslandDraw



11. Appendix C - Detailed SGML Analysis

11.1 Datalogics Parser Log

```
            SGML Document Type Definition Parser
                        Version 3.36
        Copyright (c) Datalogics 1988, 1989, 1990, 1991
                An SGML System Conforming to
              International Standard ISO 8879
              Standard Generalized Markup Language

Log file: '9373.LOG'
SDO File: 'ctndecl.sdo'
Namecase General is yes.
Namecase Entity is no.
Parsing DTD file: '9373.dtd'

DTD0095: Start tag for element 'DATABASE' cannot be omitted if the
         element had declared content (CDATA, RCDATA, EMPTY).
DTD0095: Start tag for element 'MEDIUM' cannot be omitted if the
         element had declared content (CDATA, RCDATA, EMPTY).
DTD0096: The generic ID SHORTTITLE has not been used in any content
         model, inclusion, or as a doctype element.
DTD0096: The generic ID CONTASSURPG has not been used in any content
         model, inclusion, or as a doctype element.
DTD0096: The generic ID REFDOC has not been used in any content
         model, inclusion, or as a doctype element.
DTD0096: The generic ID CFGPGE has not been used in any content
         model, inclusion, or as a doctype element.
DTD0096: The generic ID COVERINDEX has not been used in any content
         model, inclusion, or as a doctype element.
DTD0096: The generic ID STALOC has not been used in any content
         model, inclusion, or as a doctype element.
DTD0096: The generic ID TESTCODE has not been used in any content
         model, inclusion, or as a doctype element.
This DTD conforms to the ISO 8879 standard

DTO file '9373.DTO' created

closing statistics:
    Capacity points:                  72264
    Bytes of DTO file string space:   12778
    SGML descriptor blocks:           7147
```

Document Type Definition is compliant and parsed normally.

Program status code: 0.

11.2 Exoterica validator exl 2.0 Parser Log

```
<!-- Entity has no name, system id or public id in formal file -->.
<!-- **Warning** in "9373-1.sgm", line 518:
   An EMPTY element must have a start tag and must not have an end tag.
   Therefore, it is inappropriate to specify an omissible start tag or an
   inomissible end tag in its declaration.
   The element is "DATABASE".
   <!ELEMENT database        - -       EMPTY       >
                                       ^^^^^
-->
<!-- **Warning** in "9373-1.sgm", line 600:
   An EMPTY element must have a start tag and must not have an end tag.
   Therefore, it is inappropriate to specify an omissible start tag or an
   inomissible end tag in its declaration.
   The element is "MEDIUM".
   <!ELEMENT medium      -  -              EMPTY>
                                           ^^^^^
-->
<!-- **Warning**:
   An element with mixed content should permit data characters ("#PCDATA")
   everywhere.
   The element being declared is "NOTICE".
   ((((#PCDATA | ftnref | xref | indxflag | verbatim |
        ^^^^^^
-->
<!-- **Warning**:
   An element with mixed content should permit data characters ("#PCDATA")
   everywhere.
   The element being declared is "INTERNATLSTD".
   ((((#PCDATA | ftnref | xref | indxflag | verbatim |
        ^^^^^^
-->
<!-- **Warning**:
   An element with mixed content should permit data characters ("#PCDATA")
   everywhere.
   The element being declared is "HOWTOUSE".
   ((((#PCDATA | ftnref | xref | indxflag | verbatim |
        ^^^^^^
-->
```

```
<!-- **Warning** in "9373-1.sgm", line 1362:
   An element with mixed content should permit data characters ("#PCDATA")
   everywhere.
   The element being declared is "CALLOUT".
   <!ELEMENT callout             - -       (#PCDATA | graphic)           >
                                                                  /\
-->
<!-- **Warning**:
   An element with mixed content should permit data characters ("#PCDATA")
   everywhere.
   The element being declared is "ENTRY".
   ((((#PCDATA | ftnref | xref | indxflag | verbatim |
        ^^^^^^
-->
<!-- **Warning**:
   An element with mixed content should permit data characters ("#PCDATA")
   everywhere.
   The element being declared is "FTNOTE".
   ((((#PCDATA | ftnref | xref | indxflag | verbatim |
        ^^^^^^
-->
<!-- **Warning** in "9373-1.sgm", line 1613:
   An element is not allowed in the document instance because it does not
   appear in any accessible content model or it is completely excluded.
   The element is "CFGPGE".
-->
<!-- **Warning** in "9373-1.sgm", line 1613:
   An element is not allowed in the document instance because it does not
   appear in any accessible content model or it is completely excluded.
   The element is "CONTASSURPG".
-->
<!-- **Warning** in "9373-1.sgm", line 1613:
   An element is not allowed in the document instance because it does not
   appear in any accessible content model or it is completely excluded.
   The element is "COVERINDEX".
-->
<!-- **Warning** in "9373-1.sgm", line 1613:
   An element is not allowed in the document instance because it does not
   appear in any accessible content model or it is completely excluded.
   The element is "ENTRYTBL".
-->
<!-- **Warning** in "9373-1.sgm", line 1613:
   An element is not allowed in the document instance because it does not
   appear in any accessible content model or it is completely excluded.
   The element is "REFDOC".
-->
```

```
<!-- **Warning** in "9373-1.sgm", line 1613:
   An element is not allowed in the document instance because it does not
   appear in any accessible content model or it is completely excluded.
   The element is "SHORTTITLE".
-->
<!-- **Warning** in "9373-1.sgm", line 1613:
   An element is not allowed in the document instance because it does not
   appear in any accessible content model or it is completely excluded.
   The element is "STALOC".
-->
<!-- **Warning** in "9373-1.sgm", line 1613:
   An element is not allowed in the document instance because it does not
   appear in any accessible content model or it is completely excluded.
   The element is "TESTCODE".
-->
<!-- 16 warnings reported. -->
```

12. Appendix D - Detailed Raster Analysis

12.1 File D003R004

12.1.1 Output IGESView

U.S. ARMY MATERIEL COMMAND
U.S. ARMY MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

PARTS LIST

PL 10677287

CODE IDENTIFICATION NO. 18876

TITLE OSCILLATOR,VOLTAGE CONTROLLED-COHO-A3A13 | USAMICOM ECP 63343 | DATE 16 NOV 70 REV - | SHEET 3 OF

FIND NO.	PART OR IDENTIFICATION NO.	DRAWING OR SPECIFICATION NO.	NOMENCLATURE	QUANTITY	PL	MI	EFFECTIVITY FROM	EFFECTIVITY TO	ZONE	NOTES OR REMARKS
	10181751-207	10181751	RESISTOR							
	10181751-208	10181751	RESISTOR							
	10181751-209	10181751	RESISTOR							
	10181751-210	10181751	RESISTOR							
	10181751-211	10181751	RESISTOR							
	10181751-212	10181751	RESISTOR							
	10181751-213	10181751	RESISTOR							
	10181751-214	10181751	RESISTOR							
	10181751-215	10181751	RESISTOR							
2	10181752-261	10181752	RESISTOR	1						
3	10181752-357	10181752	RESISTOR	1						
4	10181751-147	10181751	RESISTOR	2						
5	10180306-239	10180306	RESISTOR	2						
6	10181751-133	10181751	RESISTOR	1						
7	10181751-166	10181751	RESISTOR	1						
8	10180328-418	10180328	RESISTOR	1						
9	10181752-283	10181752	RESISTOR	1						
10	10181752-298	10181752	RESISTOR	1						
11	10181752-306	10181752	RESISTOR	1						
12	10181752-297	10181752	RESISTOR	1						
13	10181752-289	10181752	RESISTOR	1						
14	10181752-271	10181752	RESISTOR	1						
15	10181752-310	10181752	RESISTOR	1						
16	10181751-55	10181751	RESISTOR	1						1
	10181751-1	10181751	RESISTOR							
	10181751-2	10181751	RESISTOR							
	10181751-3	10181751	RESISTOR							
	10181751-4	10181751	RESISTOR							
	10181751-5	10181751	RESISTOR							
	10181751-6	10181751	RESISTOR							

13. Appendix E - Detailed CGM Analysis

13.1 File D001C004

13.1.1 Parser Log MetaCheck

```
MetaCheck Version 2.05 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-91 CGM Technology Software
Execution Date: 07/22/93     Time:  11:08:57

Metafile Examined    : i:\9373\c104.cgm

Pictures Examined    : All
Elements Examined    : All
Bytes    Examined    : All

======================== Trace Report ========================

Tracing not selected.

============= CGM Conformance Violation Report ==============

No Errors Detected

========== CALS CGM Profile (MIL-D-28003) Report ============

No profile discrepancies detected.

================ Conformance Summary Report =================

MetaCheck Version 2.05 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-91 CGM Technology Software
Execution Date: 07/22/93     Time:  11:08:59

Name of CGM under test: i:\9373\c104.cgm
Encoding              : Binary

Pictures Examined    : All
Elements Examined    : All
Bytes    Examined    : All

BEGIN METAFILE string : "AFCTN-01Id"
METAFILE DESCRIPTION  : "AFCTN-01Id, 91-10-03, MIL-D-28003/BASIC-1"
```

Picture 1 starts at octet offset 158; string contains: "All Graphical Primitive Elements"

Conformance Summary : This file conforms to the CGM specification.
This file meets the CALS CGM Profile (MIL-D-28003).

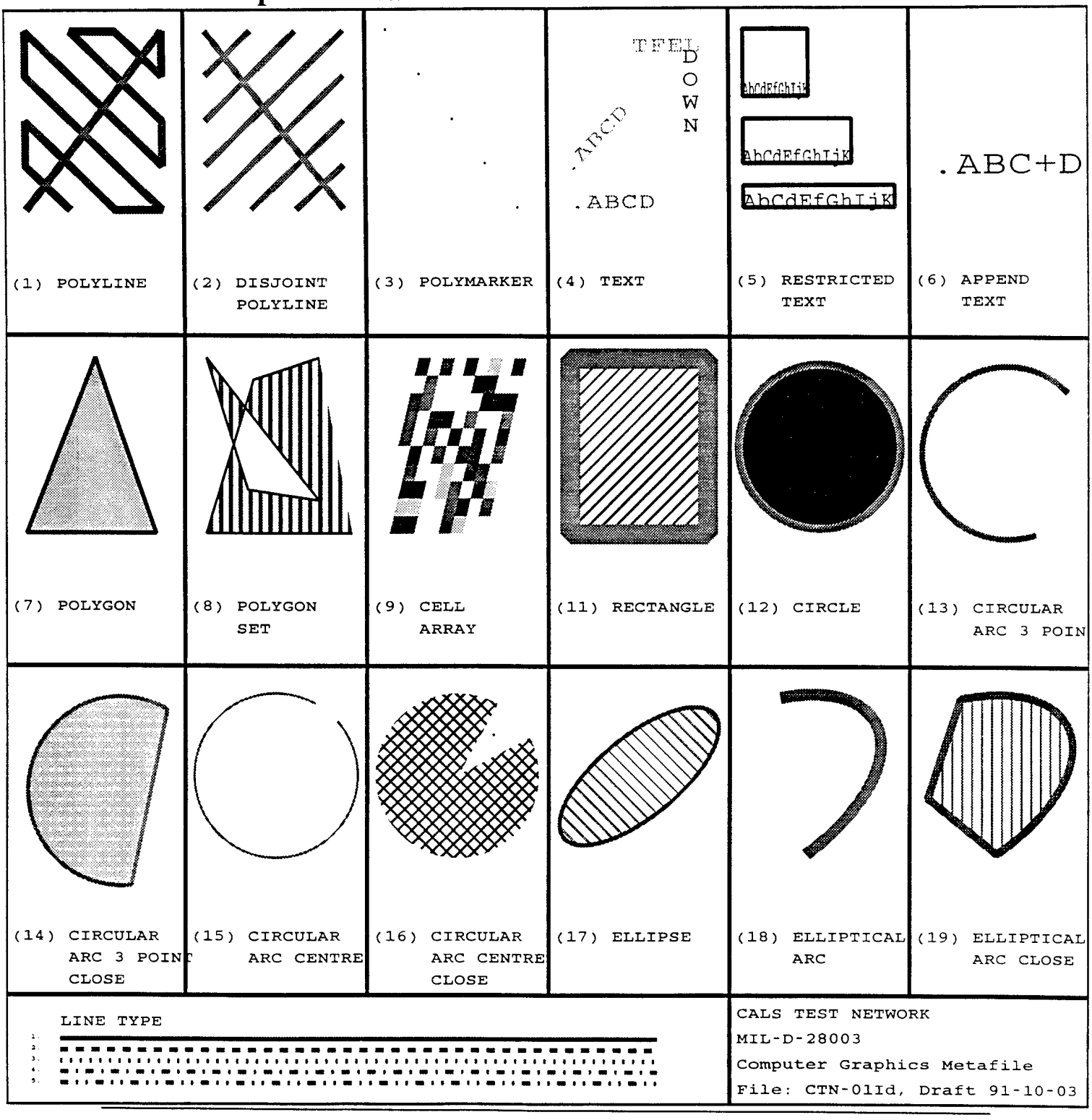
Summary of Testing Performed and Errors Found:

1 Pictures Tested
213 Elements Tested
2528 Octets Tested

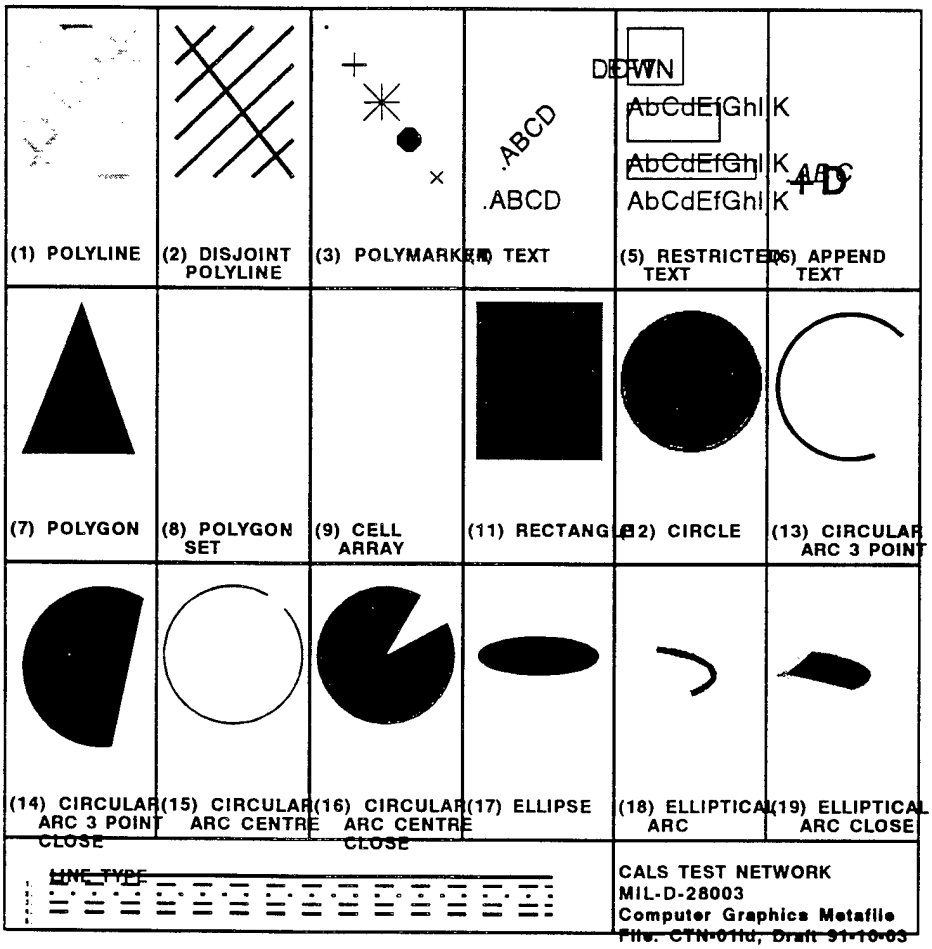
```
==================================
|    No Errors Were Detected     |
==================================
```

========== End of Conformance Report ==========

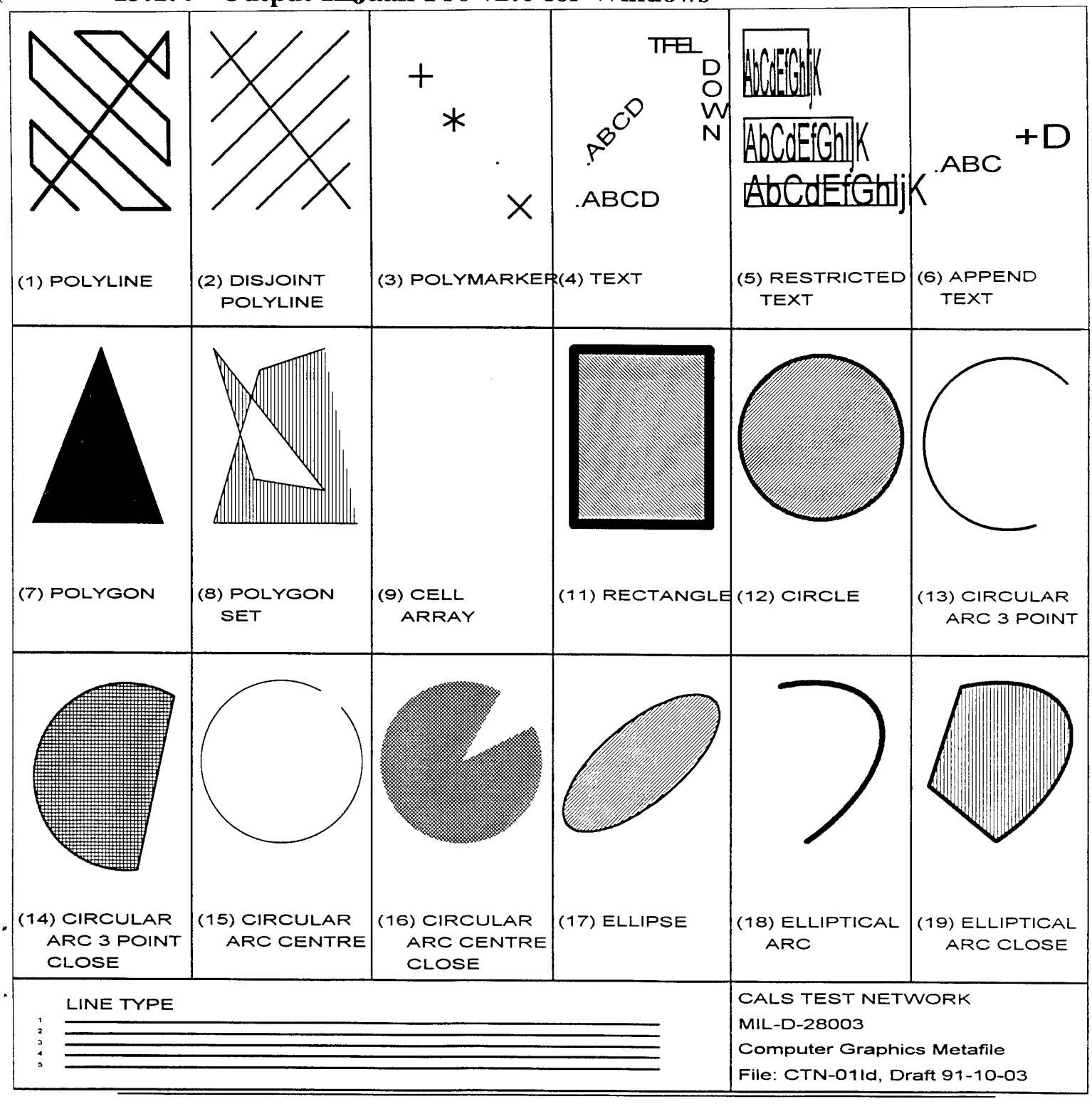
13.1.2 Output Cadleaf



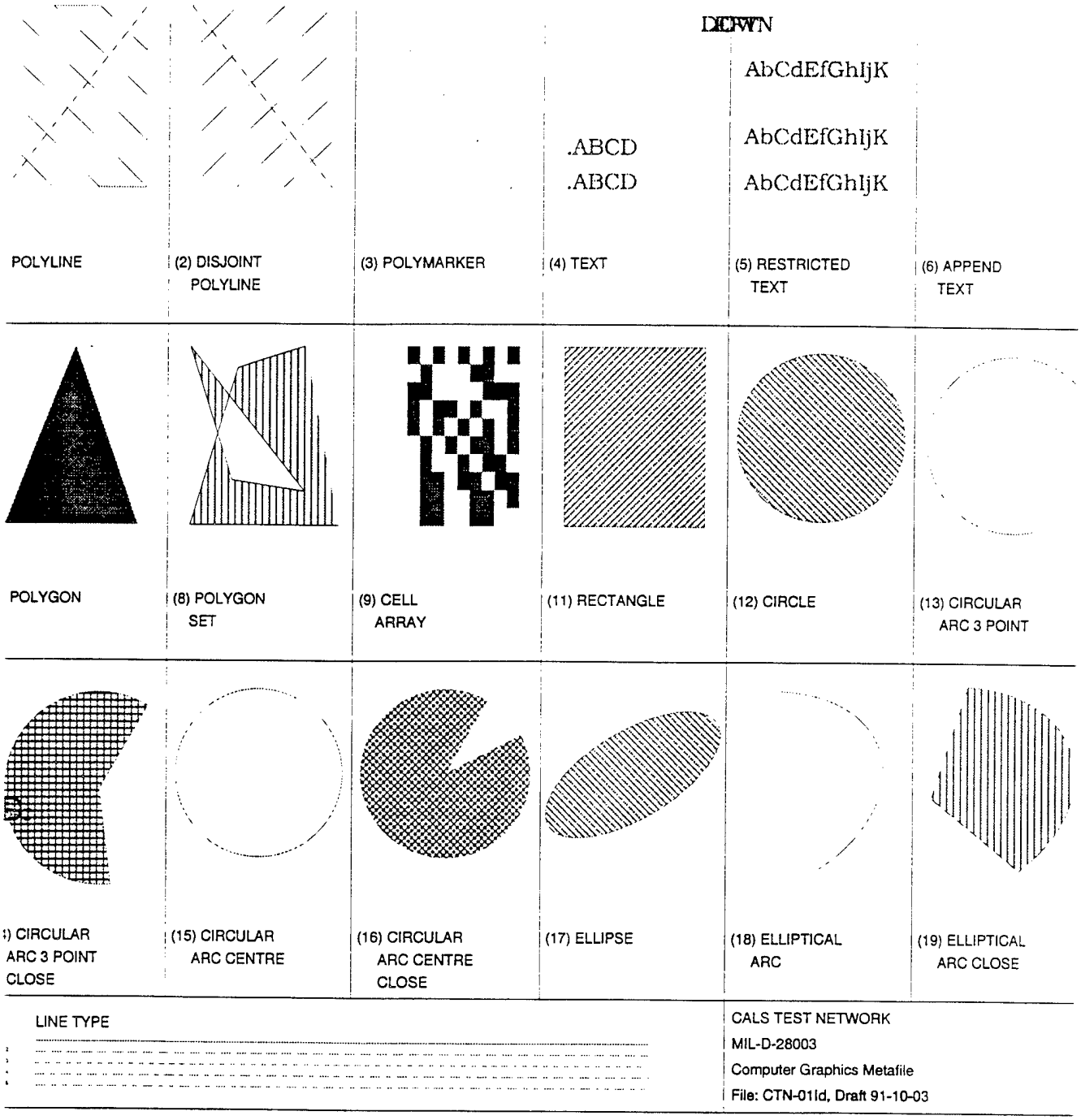
13.1.3 Output Harvard Graphics



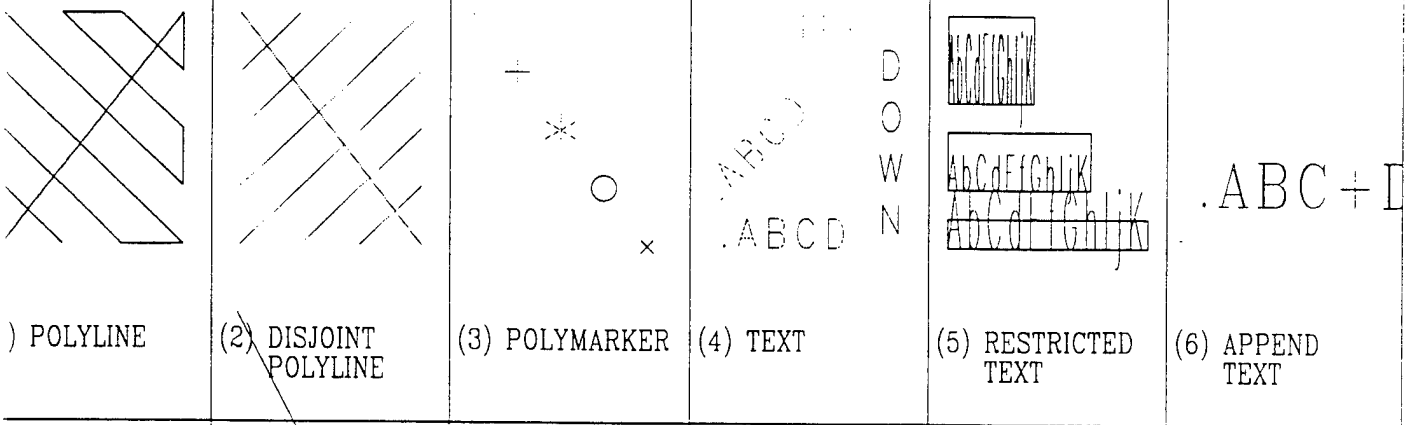
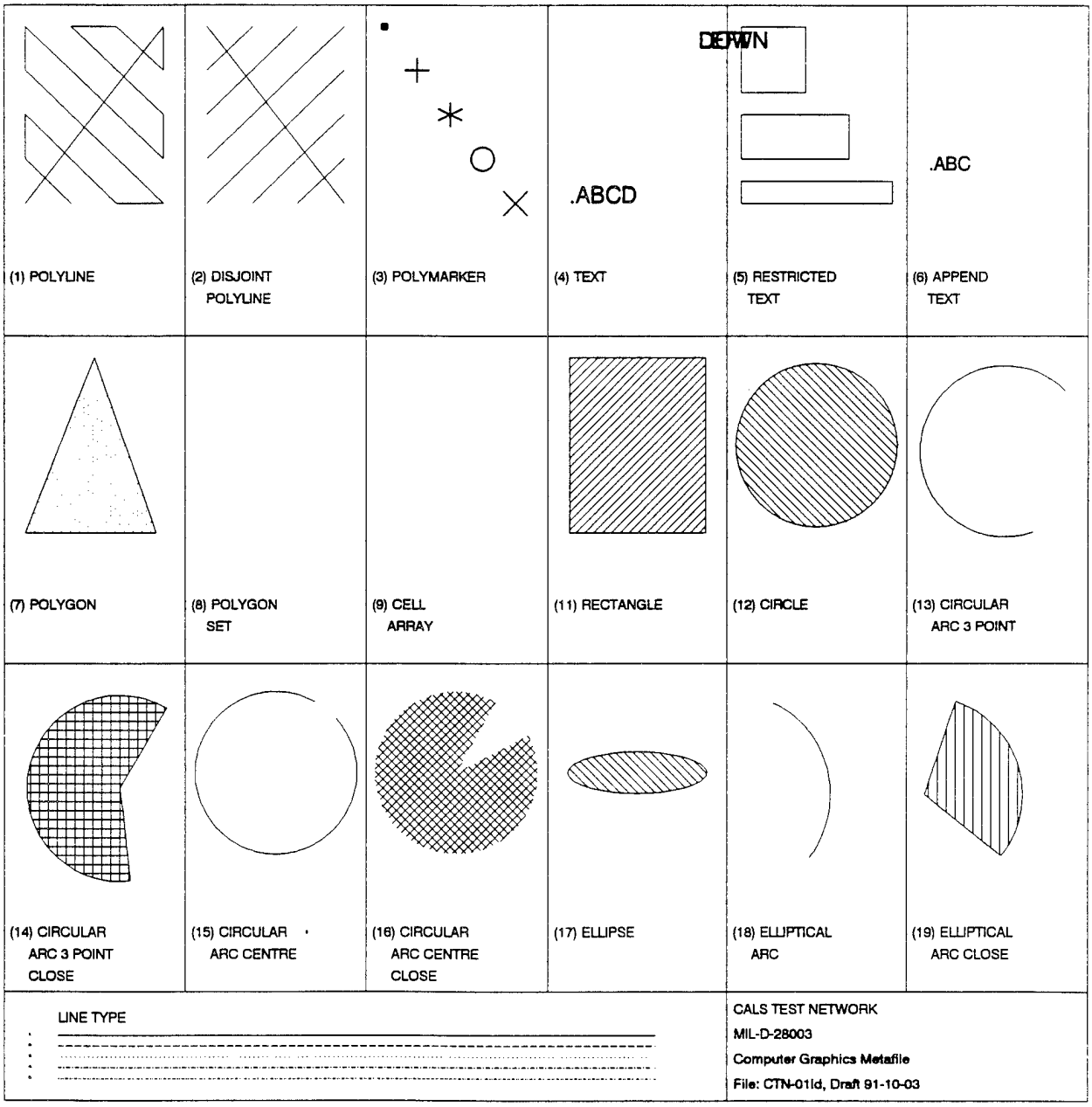
13.1.4 Output HiJaak Pro v2.0 for Windows



13.1.5 Output IslandDraw



13.1.6 Output cgm2draw/IslandDraw



13.1.7 Output Ventura Publisher